

REMARKS

Claims 1-24 are pending in the present application. Claims 1, 17 and 24 are amended herein. Support for the amendment of these claims may be found, for example, from p. 14, line 6 to p. 15, line 9 and at p. 24, lines 22-26 of the application as filed.

Applicants respectfully request reconsideration and withdrawal of the rejections of Applicants' claims, and allowance of the application.

Rejection of Claims over Roby et al.

All of the pending claims stand rejected as obvious over Roby et al., U.S. 5,726,132. Applicants respectfully traverse the rejections for at least the following reasons.

The Examiner states that Roby et al. discloses a method of lubricating an internal combustion engine the method comprising Applicants' claim limitations except that in Roby et al., the R¹ and R² groups independently have from about 1 to about 50 carbon atoms. The Examiner contends that since this range "clearly encompasses applicants claim limitation of the average total number of carbon atoms in R¹ and R² for the one or more phosphorus-containing compounds being at least 10.4", the presently claimed invention would have been obvious over Roby et al. Applicants respectfully disagree.

While this broad range of carbon atoms in R¹ and R² may "encompass" Applicants' claimed range, it in no way would have rendered obvious the specifically disclosed and claimed range and limitations placed on the number of carbon atoms in the one or more phosphorus-containing compounds of the present invention, since there is no suggestion to select the specifically delimited range in the presently pending claims.

Roby et al. discloses a phosphorus compound (C-III) which can have a general structure similar to the presently claimed invention, except that Roby et al. broadly discloses ranges of the number of carbon atoms in the R¹ and R² groups, to wit, that each R¹ and R² group may contain 1-50, or 1-30, or 1-18 or 1-8 carbon atoms, as disclosed at col. 16, lines 6-12. There is no guidance in Roby et al. to select the presently claimed range of carbon atoms, wherein the average total number of carbon atoms per phosphorus-

containing moiety is at least 10.4, wherein at least one of the R¹ and R² groups in one or more of the phosphorus-containing compounds contains 4 or fewer carbon atoms and up to about 40 percent of all the R¹ and R² groups supplied by the phosphorus-containing metal salt contain 4 or fewer carbon atoms.

As clearly shown by Applicants' Examples and in Fig. 1, the claimed range of carbon atoms per phosphorus-containing moiety is very important in obtaining the desired reduction in phosphorus emissions. As stated at page 1, lines 12-22 of the present application, the problem is to provide adequate engine lubrication and at the same time reduce catalyst contamination due to phosphorus in the exhaust gas originating from the lubricating compositions used in the engine. As shown in the Examples and Fig. 1, in a comparative example in which the phosphorus-containing compound contains 10 or fewer carbon atoms, the PEI, in mg P/L oil, is substantially higher than in an invention example in which the phosphorus-containing compound contains 10.4 or more carbon atoms.

This relationship is borne out again in Table II, in which the two comparative examples 3 and 6, having an average of 10 and 8.4 carbon atoms per phosphorus acid moiety, respectively, have substantially higher PEI values than do examples 2, 4, 5 and 7, all of which have greater than 10.4 carbon atoms per phosphorus acid moiety.

Further, Applicants note that the Examiner chose to ignore the claimed limitation of up to about 40 percent of all the R¹ and R² groups supplied by the phosphorus-containing metal salt containing 4 or fewer carbon atoms, on the basis this could be read to read on zero percent. Applicants have amended claims 1, 17 and 24 to make clear that at least one of the R¹ and R² groups in one or more of the phosphorus-containing compounds contains 4 or fewer carbon atoms. Thus, this element of the claims cannot be read on zero percent. There must be at least one of these groups having 4 or fewer carbon atoms. This is intended to clarify that it is the combination of sizes of the R¹ and R² groups that defines the desired combination of features.

Applicants have discovered that the phosphorus emissions, which would contaminate emission control system catalysts and thereby reduce their effectiveness, can

be effectively reduced by selection of the specified substituents for the R¹ and R² groups of the phosphorus-containing compounds of the present invention. Applicants respectfully submit that there is nothing in the prior art to suggest that such selection could attain such a benefit, and there is nothing in Roby et al. to guide the person of ordinary skill in the art to make the claimed selection and combination. Applicants respectfully submit that there is an extremely large number of possible combinations of substituents for the R¹ and R² groups of the (C-III) compound of Roby et al., and there is nothing to suggest the particular subset or combination discovered and claimed by the present inventors.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections of the presently pending claims 1-17 and 19-24.

Claim 18

Claim 18 stands rejected allegedly on the basis that Roby et al., at col. 15, lines 20-40, discloses that the R¹ and R² groups may be 4-methyl-2-pentyl. Applicants respectfully traverse this rejection because it is factually incorrect. The example for the R¹ and R² groups at col. 15, lines 20-40 are quite specifically disclosed as relating to the compounds (C-I) and (C-II), disclosed at col. 15, lines 1-52, not to the compounds (C-III) disclosed from col. 15, line 53 to col. 16, line 37. Thus, the mention of 4-methyl-2-pentyl at col. 15, lines 20-40 is irrelevant and inapplicable to the compounds of the presently claimed invention. For this reason, there is no substantial basis upon which the rejection of claim 18 can stand, and the rejection of this claim is clearly erroneous and without support of any substantial evidence. For this reason, this rejection should be withdrawn.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of the presently pending claim 18.

CONCLUSION

For all these reasons, Applicants respectfully submit that the presently claimed invention fully patentably distinguishes over the prior art of record and, accordingly, the present application is in condition for allowance. Notice to such effect is requested.

In the event issues arise as a result of the filing of this paper, or remain in the prosecution of this application, Applicants request that the Examiner telephone the undersigned attorney to expedite allowance of the application. Should a Petition for Extension of Time be necessary for the present Reply to the outstanding Office action to be timely filed (or if such a petition has been made and an additional extension is necessary) petition therefor is hereby made and, if any additional fees are required for the filing of this paper, the Commissioner is authorized to charge those fees to Deposit Account #12-2275, Docket No. 3167R-01.

Respectfully submitted,

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